

without the peculiarly pronounced scaly appearance of that genus, from which it is, moreover, at once distinguishable by the lobes near the gape. When the bird was first taken out of spirit these lobes were very distinct, three in number, and pure white; they have almost disappeared since the bird was skinned.

The type of this new genus I call

*Lobornis Alexandri*, sp. n.

General colour of upper surface umber-brown, the feathers of the head slightly scale-like in character; the upper tail-coverts rather more rufous brown, with which colour the wing-coverts and quills are margined; tail dull brown; entire under surface light brown, the throat and fore neck strongly tinged with rufous, as also are the flanks; the breast and under tail-coverts very slightly varied with wavy cross bars of dark brown; under wing-coverts light brown, slightly varied with obscure cross bars of darker brown; bill horn-brown, yellowish at base; feet very pale brown. Total length 3·8 inches, culmen 0·3, wing 1·65, tail 1·1, tarsus 0·6.

*Hab.* Old Calabar.

I name this bird after Dr. Alexander Smith, to whom the Museum has often been indebted for additions to its collection.

XI.—*On Priority in the Discovery of the Canal-System in Foraminifera.* By MESSRS. PARKER, JONES, and BRADY.

*To the Editors of the Annals and Magazine of Natural History.*

GENTLEMEN,

There is one paragraph in our friend Mr. Carter's paper, "On the Structure called *Eozoon canadense* in the Laurentian Limestone of Canada," in the May number of the 'Annals,' which can hardly be allowed to pass without comment; for, as it at present stands (from some oversight, doubtless, on the part of the writer), it does serious injustice to two other observers. Our attention has been called to the passage, with the suggestion that perhaps its correction would come better from unbiased lookers on, friends alike of all concerned, than from those more immediately and personally interested.

The question has nothing to do with the *Eozoon* controversy, but is simply one of priority in discovery, apparently claimed

by Mr. Carter, which only requires a few references to papers with which we have long been familiar to place on its right footing; indeed it scarcely requires an expression of *opinion* from us. The following is the passage referred to (p. 377):—

“Before Schultze’s or Carpenter’s books were published, I had described and illustrated, in the ‘Annals,’ the canal-system, ‘nummuline’ tubulation, and general structure of the Foraminifera, both in the recent *Operculina* and in the fossilized *Nummulite* (‘Annals,’ 1852, vol. x. p. 161, pl. iv.). Even Schultze in his book, as well as I can remember (for I have not the work by me to refer to), gives me the credit of having discovered the ‘canal-system,’ which at least proves the priority of my publications; and since then up to the present time I have more or less occupied myself with the structure of Foraminifera, as my papers in the ‘Annals’ will show.”

As the first portion of this sentence stands, it appears as though Mr. Carter claims not only the discovery of the “canal-system,” but also, by inference, that of the “nummuline tubulation,” and ignores researches on the same subjects published before Max Schultze’s ‘Ueber den Organismus der Polythalamien’ in 1854, and Carpenter’s ‘Introduction to the Study of the Foraminifera’ in 1862. It seems incumbent upon us therefore to point out what the real sequence of discovery was; and this may be easily done by reference to the following memoirs, viz. :—

1. Williamson, “On the Structure of the Shell and Soft Animal of *Polystomella crispa*,” 1848. Trans. Micr. Soc. Lond. vol. ii. p. 159.

2. Carpenter, “On the Microscopic Structure of *Nummulina*, *Orbitolites*, and *Orbitoides*,” 1849. Q. J. Geol. Soc. vol. vi. p. 21.

3. Williamson, “On the Minute Structure of the Calcareous Shells of some Recent Species of Foraminifera,” 1850. Trans. Micr. Soc. Lond. vol. iii. p. 105.

4. Williamson, “On the Minute Structure of a Species of *Faujasina*,” 1851. Q. J. Micr. Science, vol. i. p. 87.

These were all published, as will be seen, before Mr. Carter’s well-known and excellent paper “On the Form and Structure of the Shell of *Operculina arabica*,” 1852 (Journal of the Bombay Branch of the Royal Asiatic Society, January part, 1853). We are well acquainted with Mr. Carter’s previous paper “On Foraminifera, their Organization and their existence in a Fossilized State in Arabia, Sindh, Kutch, and Kattywar” (*ibid.* vol. for 1849); but it does not appear to us to contain any thing affecting the present issue. Neither need we allude to Dr. Carpenter’s various contributions to the ‘Philosophical Transactions’ between 1856 and 1860, which, though published

before his "book," were subsequent to Mr. Carter's memoir on *Operculina arabica*, the question really being how far the apparently sweeping claim of priority in discovery is justified by the researches embodied in this latter memoir.

In Professor Williamson's paper on *Polystomella crispa* we have the earliest results of the microscopical investigation of the minute structure of the shells of Foraminifera based upon transparent sections. The calcareous shells are therein spoken of as perforated by a multitude of minute foramina; and the solid umbilical nucleus is described as "pitted by small but deep depressions, which may be designed to facilitate the exit of pseudopodia from the innermost convolutions." This appears to us the first indication of the existence of the canal-system—an *indication*, of course, rather than an actual discovery.

Dr. Carpenter's paper, presented to the Geological Society in the following year (1849), "On the Microscopic Structure of *Nummulina*, *Orbitolites*, and *Orbitoides*," comes next in point of time. In it the minutely tubular structure of the shell of the Nummulite is described with a completeness and figured with an exactness that has left little for subsequent addition. A system of "canals" opening into the chambers by distinct orifices, and terminating in the "interseptal spaces," is described and figured; and the specialized condition of the marginal portion of each whorl, so far as the perforation by a smaller number of larger tubuli, is pointed out. Thus, though the "canal-system" (as a system) was not traced in its entirety, owing to the research being based upon fossil specimens alone, a large proportion of the facts necessary for its establishment were correctly laid down.

In 1850 Prof. Williamson made a further contribution to the subject in his memoir "On the Minute Structure of the Calcareous Shells of some Recent Species of Foraminifera," which contains chiefly the record of investigations on the structure of two species of *Amphistegina*, and on a so-called *Nonionina* from the Philippines (really an *Operculina*), together with other matters. Not only is the parallel tubulation in the chamber-walls herein described, but also the "canal-system" of the marginal portion of the spire, the large radiating tubes (of Dr. Carpenter's paper) being shown to be part of a plexus of canals communicating with the interseptal spaces, which plexus is minutely described and figured. The connexion of the interseptal spaces with at least one continuous tube in each of the spiral parietes separating contiguous canals is demonstrated; in fact Professor Williamson had, in 1850, made out almost the entire canal-system of the *Operculina* type.

The following year the same able investigator communicated a third memoir to the Microscopical Society, "On the

Minute Structure of a Species of *Faujasina*," the form now known as *Rotalia Schræteriana*, in which he gave a complete and accurate account, with admirable figures, of the remarkable canal-system of what may be regarded as the most highly organized form of the Rotalian type.

Thus before Mr. Carter's paper of 1852 the "nummuline tubulation" and the "canal-system" of the Operculine and Rotalian types and an important part of that of *Nummulina*, as well as all that concerned the general structure of these, had been thoroughly worked out. It is no part of our present purpose to examine critically what Mr. Carter's paper really added to the facts established by previous observers; we have followed his researches in no unappreciative spirit: nor do we wish it to be inferred that living in India, as he was at that time, the papers published only a year or two previous to his own had prompted or guided his investigations: in a word, we do not desire in any way to detract from the originality of his work, except so far as in the memoir itself he acknowledges previous investigations; but whatever might be the case then, it cannot be right now, with the opportunity at hand of ascertaining how far his published results really had priority, to ignore the main facts of the papers we have quoted.

The value of Mr. Carter's labours seems to us to have been justly stated in Carpenter's 'Introduction;' and the researches of the three observers we have named are placed in honourable companionship by D'Archiac and Haime, in their classical work on Nummulites (published a year after Mr. Carter's paper), in the following terms:—

"L'étude de la structure intime des Nummulites a fait de véritables progrès par suite des recherches de M. W. C. Williamson, de M. W. B. Carpenter et de M. Carter."

We may just add that the appeal to Max Schultze's work in confirmation of priority is not very fortunate; for the same three observers are all mentioned in the same paragraph, the opening sentence of which is "Eine Erwähnung verdient hier das eigenthümliche System von Canälen welches Carter in der Schale von *Operculina arabica* und Williamson an einer *Faujasina* beschrieben haben;" and as the dates 1852 and 1851 respectively are given in the footnote, it cannot be said that the learned German professor assigns priority in discovery specially to Mr. Carter.

We are, Gentlemen,

Yours faithfully,

W. K. PARKER,

T. RUPERT JONES,

HENRY B. BRADY.